Application Serial No. 08/169,298, filed December 7, 1993, now U.S. Patent No. 5,545,291, the disclosure of which is hereby incorporated in its entirety for all purposes.

This application is also related to U.S. Application Serial No. 08/437,540, filed May 9, 1995, now U.S. Patent No. 5,783,856, which is a divisional of U.S. Application Serial No. 08/169,298, filed December 7, 1993, now U.S. Patent No. 5,545,291, the disclosure of which is hereby incorporated in its entirety for all purposes.--

IN THE CLAIMS:

Please cancel claims 1-25 and add new claims 26-139 as follows:

26. A structure comprising an assemblage of separate functional blocks, each functional block having a first surface and a second surface substantially parallel to said first surface, said functional block further having side surfaces connecting said first surface to said second surface, said first surface having a smaller area than said second surface.

27. The structure of claim 26 wherein said functional block has a maximum linear dimension of about 50 microns or less.

28. The structure of claim 26 wherein said functional block has a trapezoidal cross-section.

29. The structure of claim 26 wherein said side surfaces are etched surfaces.

30. The structure of claim 26 wherein said functional block is a multilayered structure.

31. The structure of claim 30 wherein said multilayered structure includes a metal layer.

32. The structure of claim 30 wherein said multilayered structure includes an insulator layer.

33. The structure of claim 30 wherein said multilayered structure includes a layer of silicon dioxide.

34. The structure of claim 30 wherein said multilayered structure includes a layer of silicon nitride.

35. The structure of claim 26 wherein said functional block comprises material is selected from the group consisting of silicon, gallium arsenide, aluminum gallium arsenide, diamond, and germanium.

36. The structure of claim 26 wherein said functional block comprises a group III-V compound.

37. The structure of claim 26 wherein said functional block comprises a group II-VI compound.

38. The structure of claim 26 wherein the perimeter of said first surface has a rectangular shape, an octagonal shape, or a circular shape.

39. A functional block comprising semiconductor material and having a profile of a shape generally that of a truncated pyramid, said functional block having a maximum linear dimension of about 50 microns or less, said functional block being separated from a substrate.

40. The functional block of claim 39 further having a first surface and a second surface substantially parallel to said first surface.

41. The functional block of claim 40 wherein the perimeter of said first surface has a rectangular shape, an octagonal shape, or a circular shape.

42. The functional block of claim 39 wherein said semiconductor material is a multilayered structure.

43. The functional block of claim 39 wherein said semiconductor material is a group III-V compound.

44. The functional block of claim 43 wherein said semiconductor material is gallium arsenide.

45. The functional block of claim 39 wherein said semiconductor material is a light-emitting diode.

46. The functional block of claim 45 wherein said semiconductor material is a gallium arsenide light-emitting diode.

47. The functional block of claim 39 wherein said semiconductor material is a laser diode.

48. The functional block of claim 39 having one of a cylindrical shape, a rectangular shape, a square shape, a hexagonal shape, a pyramid shape, a T-shape, and a kidney shape.

49. A shaped block of material adapted for being received in a recess of a substrate, said shaped block of material comprising a solid having sloped sides and a top surface connected to a bottom surface by said sloped sides, said top surface being substantially parallel to said bottom surface, said top surface being non-congruent with said bottom surface.

50. The shaped block of claim 49 wherein said block of material has a maximum linear dimension of about 50 microns or less.

51. The shaped block of claim 49 wherein said sloped sides are etched sides.

52. The shaped block of claim 49 wherein said sloped sides have a slope greater than about twenty degrees relative to a line normal to said top surface.

53. The shaped block of claim 49 wherein said material comprises a multilayered structure.

54. The shaped block of claim 49 wherein said material is selected from the group consisting of silicon, gallium arsenide, aluminum gallium arsenide, diamond, and germanium.

55. The shaped block of claim 49 wherein said material is a group III - V compound.

56. The shaped block of claim 49 wherein said material is a group II - VI compound.

57. The shaped block of claim 49 being an optical detector.

58. The shaped block of claim 49 wherein the perimeter of said first surface has a rectangular shape, an octagonal shape, or a circular shape.

59. A functional block comprising a semiconductor material and having a shape adapted for self-alignment within a shaped opening through a substrate surface, said block having a first surface and a second surface and having etched sides which are sloped such that said block fits into said shaped opening only in an orientation where said first surface is exposed through said substrate surface.

60. The functional block of claim 59 wherein said first surface includes a conductive contact disposed thereon.

61. The functional block of claim 59 wherein said first surface has an area smaller than said second surface.

62. The functional block of claim 61 wherein said first surface has a circular perimeter, a rectilinear perimeter, or an octagonal perimeter.

63. The functional block of claim 59 having a maximum linear dimension of about 50 microns or less.

64. The functional block of claim 59 further comprising a multilayered structure.

65. The functional block of claim 64 wherein said multilayered structure includes a metal layer.

66. The functional block of claim 64 wherein said multilayered structure includes an insulator layer.

67. The functional block of claim 64 wherein said multilayered structure includes a layer of silicon dioxide.

68. The functional block of claim 64 wherein said multilayered structure includes a layer of silicon nitride.

69. The functional block of claim 59 being a light-emitting diode.

70. The functional block of claim 59 being a laser diode.

71. The functional block of claim 59 being an optical detector.

72. A semiconductor microstructure comprising a wedge-shaped block having a first surface substantially parallel to a second surface, said first surface having an associated first area, said second surface having an associated second area, said first area being larger than said second area, said block having a maximum linear dimension of about 50 microns or less.

73. The semiconductor microstructure of claim 72 wherein said wedge-shaped block comprises material selected from the group consisting of silicon, gallium arsenide, aluminum gallium arsenide, diamond, and germanium.

74. The semiconductor microstructure of claim 72 wherein said wedge-shaped block comprises a group III-V compound.

75. The semiconductor microstructure of claim 72 wherein said wedge-shaped block comprises a group II-VI compound.

76. The semiconductor microstructure of claim 72 wherein said wedge-shaped block is a multilayered structure.

77. The semiconductor microstructure of claim 76 wherein said multilayered structure constitutes a light-emitting diode.

78. The semiconductor microstructure of claim 77 wherein said multilayered structure includes gallium arsenide.

79. A portion of an integrated circuit device comprising a functional block separated from a substrate, said functional block comprising a semiconductor material and having a maximum linear dimension of about 50 microns or less, said functional block having a wedge-shaped profile, said functional block having etched sides.

80. The portion of an integrated circuit device of claim 79 wherein said semiconductor material is a multilayered structure.

81. The portion of an integrated circuit device of claim 79 wherein said semiconductor material is selected from the group consisting of silicon, gallium arsenide, aluminum gallium arsenide, diamond, and germanium.

82. The portion of an integrated circuit device of claim 79 wherein said semiconductor material is a group III-V compound.

83. The portion of an integrated circuit device of claim 79 wherein said semiconductor material is a group II-VI compound.

84. The portion of an integrated circuit device of claim 79 wherein said semiconductor material constitutes a light-emitting diode.

85. The portion of an integrated circuit device of claim 84 wherein said light-emitting diode is a gallium arsenide light-emitting diode.

86. An electronic chip comprising a block of material separated from a substrate and having a first surface and a second surface substantially parallel to said first surface, said block further having etched side surfaces extending from said first surface to said second surface, said first surface having an areal measurement different than an areal measurement of said second surface, said first surface having a conductive contact disposed thereon.

87. The electronic chip of claim 86 wherein said block of material has a width of about 50 microns or less and a length of about 50 microns or less.

88. The electronic chip of claim 86 wherein said etched side surfaces have a slope relative to a line normal to said first surface of greater than about twenty degrees.

89. The electronic chip of claim 86 wherein said material comprises a multilayered structure including one or more layers of semiconductor material.

90. The electronic chip of claim 89 wherein said multilayered structure includes a silicon layer and a gallium arsenide layer.

91. The electronic chip of claim 89 wherein said multilayered structure includes a p-type gallium arsenide layer, an n-type gallium arsenide layer, and a eutectic layer.

92. The electronic chip of claim 91 wherein said multilayered structure further includes a silicon substrate layer.

93. The electronic chip of claim 86 wherein said material is semiconductor material.

94. The electronic chip of claim 86 wherein said electronic chip is a light-emitting diode.

95. The electronic chip of claim 86 wherein said electronic chip is a gallium arsenide resonant tunneling diode.

96. The electronic chip of claim 86 wherein said electronic chip is a gallium arsenide diode.

97. The electronic chip of claim 86 wherein said electronic chip is a gallium arsenide microwave device.

98. The electronic chip of claim 86 having one of a cylindrical shape, a rectangular shape, a square shape, a hexagonal shape, a pyramid shape, a T-shape, and a kidney shape.

99. An electronic chip comprising a functional block including a semiconductor material, said functional block having a wedge shape with a top surface and a bottom surface smaller than said top surface, said functional block further having a maximum linear dimension of about 50 microns or less, the perimeter of said top surface having a rectilinear shape, a circular shape, or an octagonal shape.

100. The electr nic chip of claim 99 wherein said top surface is substantially parallel to said bottom surface.

101. The electronic chip of claim 99 further including a conductive contact disposed atop said top surface.

102. The electronic chip of claim 99 wherein said semiconductor material is a multilayered structure.

103. The electronic chip of claim 102 wherein said multilayered structure constitutes a light-emitting diode.

104. An electronic component separated from a first substrate comprising:

a first surface;

a conductive contact disposed atop said first surface;

a second surface in substantially parallel relation to said first surface; and

etched surfaces connecting said first surface to said second surface,

said etched surfaces being in non-parallel relation to one another,

wherein said electronic component is adapted for self-alignment within a shaped opening through a surface of a second substrate.

105. The electronic component of claim 104 wherein said amount of semiconductor material has a maximum linear dimension of about 50 microns or less.

106. The electronic component of claim 104 wherein said etched surfaces are formed by a wet etch process.

107. The electronic component of claim 104 wherein said etched surfaces are formed by a mask edge.

108. The electronic component of claim 104 wherein said etched surfaces are formed by a reactive ion etch process.

109. The electronic component of claim 104 wherein said etched surfaces are formed by an ion milling process.

110. The electronic component of claim 104 being a light-emitting diode.

111. A light-emitting diode (LED) comprising a semiconductor block having tapered sides, said semiconductor block comprising a first surface and a second surface in substantially parallel relation to said first surface.

112. The LED of claim 111 wherein said semiconductor block has a maximum linear dimension of about 50 microns or less.

113. The LED of claim 111 wherein said tapered sides are etched sides.

114. The LED of claim 111 incorporated in an active display.

115. The LED of claim 111 wherein said semiconductor block is a multilayered structure.

116. The LED of claim 115 wherein said multilayered structure includes gallium arsenide.

117. The LED of claim 115 wherein said multilayered structure includes a group III-V compound.

118. A light-emitting diode (LED) comprising an amount of semiconductor material, said semiconductor material having a first surface and a second surface smaller than said first surface, said semiconductor material having non-parallel

side surfaces connecting said first surface to said second surface, said LED having a maximum linear dimension of about 50 microns or less.

119. The LED of claim 118 wherein said first surface is in substantially parallel relation to said second surface.

120. The LED of claim 118 wherein said semiconductor material includes a group III-V compound.

121. The LED of claim 120 wherein said semiconductor material includes gallium arsenide.

122. The LED of claim 118 wherein the perimeter of said first surface has a rectangular shape, an octagonal shape, or a circular shape.

123. A light-emitting diode (LED) comprising a block of semiconductor material including gallium arsenide, said block having a top surface and a bottom surface connected to said top surface by sloped surfaces, said block having a maximum linear dimension of about 50 microns or less.

124. The LED of claim 123 wherein said sloped surfaces are etched surfaces.

125. The LED of claim 124 wherein said etched surfaces are formed by a wet etch process.

126. The LED of claim 124 wherein said etched surfaces are formed by a mask edge.

127. The LED of claim 124 wherein said etched surfaces are formed by a reactive ion etch process.

128. The LED of claim 124 wherein said etched surfaces are formed by an ion milling process.

129. The LED of claim 123 wherein the perimeter of said top surface has a rectangular shape, an octagonal shape, or a circular shape.

130. A laser diode comprising a wedge-shaped block of semiconductor material having a maximum linear dimension of about 50 microns or less.

131. The laser diode of claim 130 wherein said semiconductor material comprises a group III-V compound.

132. The laser diode of claim 131 wherein said semiconductor material comprises gallium arsenide.

133. The laser diode of claim 130 wherein said block comprises first and second surfaces in parallel relation and etched side surfaces connecting said first and second surfaces, said first surface having an area different than an area of said second surface.

134. The laser diode of claim 130 incorporated in an optical data channel.

135. An optical detector comprising a wedge-shaped block of semiconductor material having a maximum linear dimension of about 50 microns or less.

136. The optical detector of claim 135 wherein said semiconductor material comprises a group III-V compound.

137. The optical detector of claim 136 wherein said semiconductor material comprises gallium arsenide.